Space Weather Forecast

Issued on Monday, 07 March 2022 at 13:27 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Chance of isolated Moderate flares. Weak coronal mass ejection (CME) arrivals possible, with a chance of G1/Minor Storms mainly late day 4 (10th)

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was low over the period with one common class flare. There are six sunspot regions on the Earth-facing disc. The largest of these is a bipolar region in the southeast, but this has remained fairly inactive in the last 24 hours. The only common class flare was from another smaller bipolar region in the southwest disc. Further small bipolar regions are visible in the southwest, centre disc and northeast. The first of these is showing signs of decay, whilst the second is a newly emerged and developing region. The region the northeast does have a history of small common flares, remains relatively simple. There was an eruption of a filament (a line of plasma held together by the Sun) around 06/2245 UTC, which produced a coronal mass ejection. This has been analysed as having a potential Earth-directed component with a glancing impact late on the 10th.

Solar Wind / Geomagnetic Activity: Solar winds have been elevated with recent enhancements from the fast wind of a coronal hole easing. The associated magnetic field has remained weak, and whilst often with its north-south component in a negative (southward) direction this also remained weak ensuring that geomagnetic activity remained Quiet to Unsettled (Kp1-3)

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be Low to Very Low, with further occasional C-class flares but with a chance of rising to Moderate from any M-class flares.

Solar Wind / Geomagnetic Activity: There are a couple of weak CMEs which may glance the Earth late on day 1 (7th) or on late day 3 or day 4 (9th or 10th), but these are very low confidence, before a more likely glancing arrival late day 4 (11th) from the filament CME that occurred on the 6th. Otherwise no solar wind enhancements are expected, with speeds easing towards background. Geomagnetic activity is forecast to be mainly Quiet, with a chance of Unsettled intervals. Isolated Active spells are possible day 1 (7th) and late day 3 or day 4 (9th and 10th) from any CME arrival. There is a slight chance of G1/Minor Storm intervals, mainly late day 4 (11th) from the glancing arrival of the third CME.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to persist at background with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	1	5	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	25	25	25	25
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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